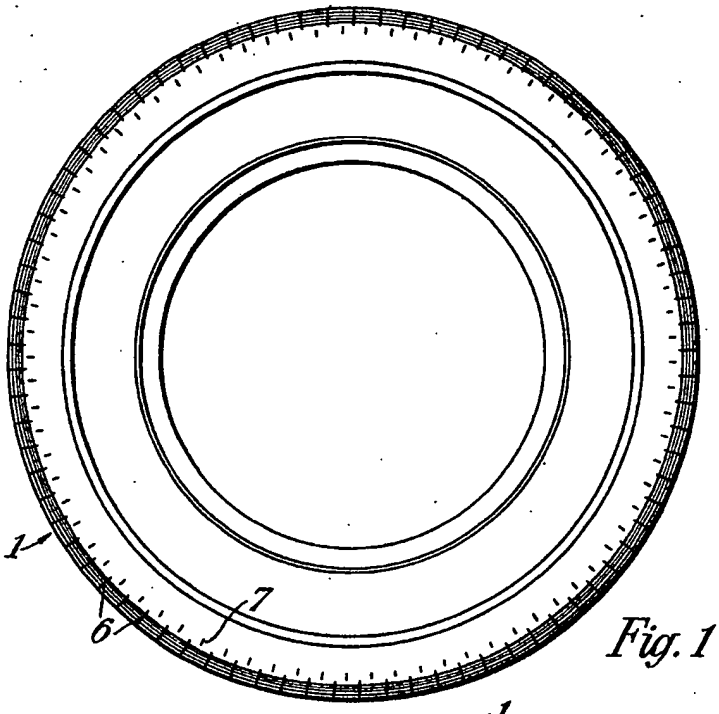

Fig. 1

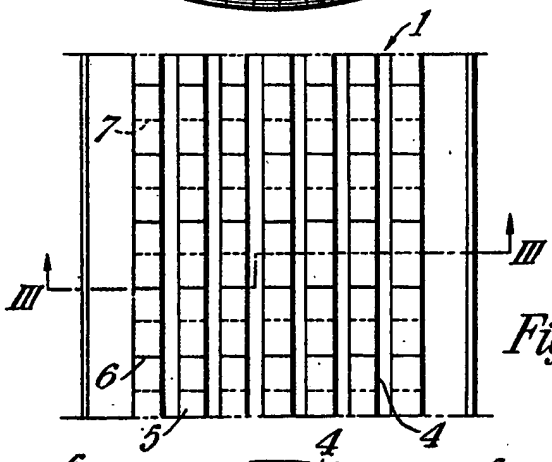

Fig. 2

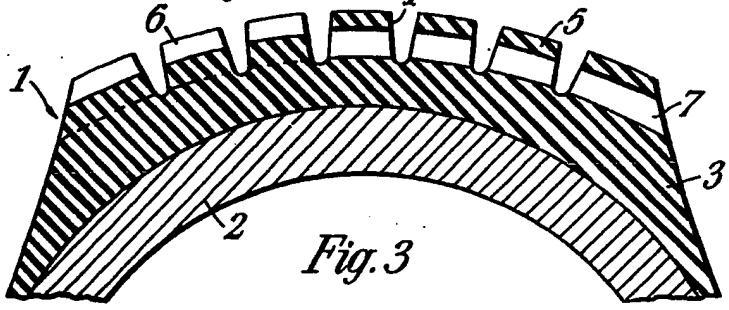

Fig. 3

Malby & Sons Photo-Litho.

PATENT SPECIFICATION

Convention Date (United States) : Feb. 25, 1938.
Application Date (In United Kingdom) : Feb. 20, 1939.
Complete Specification Accepted : Aug. 15, 1939.

511,271
No. 5672/39.

COMPLETE SPECIFICATION

Improvements in Pneumatic Tyre Treads

We, UNITED STATES RUBBER COMPANY, of 1790, Broadway, New York City, United States of America, a corporation organised and existing under the laws of the State of New Jersey, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to pneumatic tyres, and in particular it relates to the antiskid configuration of pneumatic tyres. More particularly, the invention relates to a pneumatic tyre tread having an antiskid configuration and having slits extending transversely of the tread and in different position relative to the tread surface.

In general, the invention comprises a pneumatic tyre having a tread the antiskid configuration of which forms a plurality of circumferentially and substantially continuous ribs, and having a plurality of slits extending tranversely of the tread, some of the slits communicating with the tread surface and some of the slits lying entirely below the tread surface.

In the treatment of pneumatic tyres to increase their resistance against skidding, it has been found that transverse slits extending across the tread have been of considerable benefit. However, it has been found preferable to limit the depth of the slits to substantially one-half of the height of the antiskid elements. Such a limitation requires that additional slits be made in the tyre after the tread wears down to the extent that the original slits become ineffective. In accordance with the practice of our invention, we provide a tyre tread having substantially continuous ribs with transverse slits which extend in depth to about one-half the height of the antiskid elements, and in addition we provide transverse slits which are positioned between the first named successive slits and which are located below the tread road contacting surface. By arranging the slits in this manner it is not necessary to reslit the tread after the tyre is worn down to approximately the depth of the slits which communicate with the tread surface.

It has already been proposed to form transverse grooves both in the tread surface of a tyre and below said tread surface, said grooves involving the removal of substantial amounts of rubber.

Other objects and advantages will appear more fully in the following detailed description when considered in connection with the accompanying drawings, in which:—

Figure 1 is an elevational view of a portion of a tyre treated in accordance with the practice of our invention;

Figure 2 is a plan view of a portion of the tyre shown in Figure 1; and

Figure 3 is a transverse view, in section, of a portion of the tyre taken along lines III—III of Figure 2.

Referring to the drawings, we show a pneumatic tyre 1, the principal structural elements of which are conventional, and which includes a carcass 2 of strain resisting elements and a tread 3 of rubber composition. A plurality of circumferentially extending grooves are formed in the tread 3, resulting in the formation of a plurality of circumferentially extending, continuous ribs 5.

Preferably, the ribs 5 are relatively narrow. This is essential in order to permit any lubricating material, such as a film of water with which the ribs may engage in service, to move laterally of the ribs and into the grooves 4. Obviously, if the ribs are relatively wide the lubricating material must move a greater distance, a feature which is objectionable to proper skid or traction control. In the preferred embodiment of our invention we show a tyre having seven circumferentially extending ribs. This number of ribs is intended for application on standard size passenger car tyres such as 5.25 to 7.50 sizes. When the treads of these tyres are in the form of at least seven circumferential ribs the resulting ribs are sufficiently narrow to provide good antiskid quality, but are sufficiently wide to insure stability of the tyre. The narrow rib tread formation is also of advantage in respect to lateral skidding. This advan-

[Price 1/-]

tage is obtained through the wiping action resulting from the numerous marginal edges of the ribs which engage with the road surface.

While reference is made to continuous, circumferentially extending ribs, it is to be understood that the ribs may embody lateral projections or indentations and that the invention contemplates substantially or functionally continuous ribs.

After a tyre embodying the foregoing features is vulcanized, it is treated by providing transversely extending slits 6 which form separations across the path of the circumferentially continuous ribs 5. These slits are made without removing substantially any of the rubber composition. In depth, the slits 6 are substantially equal to one-half the height of the ribs. This limitation on the depth of the slits is preferable in order to prevent excessive distortion of the antiskid elements formed by the ribs and the slits, and to prevent impairment of the tread due to cracking or tearing in the region of the tread at the base of the slits.

The slits 6 which communicate with the outer surface of the ribs 5 are applied to the tyre in spaced relation throughout the circumference thereof. The slits may be spaced uniformly around the circumference, or they may be spaced irregularly in order to interrupt uniformity thereby being conducive to more quiet operation. The slits 6 may be spaced apart a distance ranging from approximately one inch to two inches.

The function of the ribbed tread combined with the transversely extending slits produces very satisfactory results in respect to resistance against directional and lateral skidding. However, as the tread wears down the slits 6 become non-existent and it becomes necessary to reslit the tread or lose the advantage resulting from the slit formation.

In order to provide a tyre in which the slits will function throughout the useful life of the tyre, we provide additional or sub-slits 7 which are located circumferentially between the slits 6 but which originally do not communicate with the outer surface of the ribs. These sub-slits, like the slits 6, extend transversely of the ribs 5 and have a height substantially equal to one-half of the height of the ribs 5. Also, the sub-slits are formed without removing substantially any of the rubber composition of the tread. Preferably, the sub-slits extend slightly above the base of the grooves 4; that is, the region of the groove bases is not affected by the sub-slits. The lower margin of the sub-slits 7 should extend approximately 1/32 inch above the base of the grooves 4.

While the height of the slits 6 and sub-slits 7 is each equal to about one-half of the total height of the ribs 5, these slits are so arranged in height that there is a slight overlapping of the slits relative to the sub-slit. This condition is desirable because, as the tread wears down and the slits 6 become non-existent, the sub-slits 7 will have appeared at the outer surface of the ribs 5, thus providing a transversely slit ribbed tread throughout the useful life of the tyre.

While we have shown and described a preferred embodiment of our invention, it is to be understood that we contemplate those modifications which appear obvious and which appear within the scope of the appended claims.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

(1) In a pneumatic tyre a body of tread rubber compositon, the road engaging portion of said tread composition being provided with grooves defining a plurality of circumferentially extending functionally continuous ribs, at least some of said ribs being interrupted by transverse slits formed without the removal of substantially any of the rubber composition, some of said slits forming separations communicating with the road contacting surface of the ribs and some of said slits forming separations lying entirely below the surface of said ribs.

(2) A pneumatic tyre tread according to claim (1) wherein the slits lying entirely below the surface of said ribs are situate between the first named slits.

(3) A tyre tread according to either of the preceding claims wherein some of the slits extend in depth to substantially one half of the height of the ribs while the other slits extend from substantially the base of the ribs to one half of the height of the ribs.

(4) A pneumatic tyre tread according to any of the preceding claims wherein the slits extend transversely of the ribs and are formed without removal of substantially any of the rubber composition.

(5) A pneumatic tyre tread according to any of the preceding claims wherein the height of the slits lying below the surface of the ribs is such as to overlap in part the slits which communicate with the surface of the ribs.

(6) A pneumatic tyre tread according to any of Claims 1 to 5 wherein the slits lying below the surface of the ribs have their lower marginal edges terminating above the base of the grooves defining the ribs.

Dated this 20th day of February, 1939.

T. A. CLAYTON,
Acting for Applicants.

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